

77. A variable capacitor comprising:  
at least one variable capacitor unit, said capacitor unit comprising:  
a capacitor;  
at least two transistors each connected in series with said capacitor; and  
a biasing circuit for biasing said transistors, wherein an impedance value of said capacitor unit is controlled by selectively varying said biasing for said transistors to control an effective resistance of said transistors, wherein said impedance is varied in proportion to a current allowed by said effective resistance of said transistors.

78. The variable capacitor of claim 77 wherein each of said capacitor units are connected to each other in parallel.

79. The variable capacitor of claim 77 wherein said variable capacitor is adjusted across a total impedance range by sequentially varying between a minimum and maximum impedance value of each of said variable capacitor units.

80. The variable capacitor of claim 77 wherein said transistors are field effect transistors (FET).

## REMARKS/ARGUMENTS

### I. General

Claims 1-80 are pending in the present application, although claims 77-80 have been withdrawn from consideration by the Examiner. Applicant notes with appreciation the Examiner's indication that claims 7-24 and 36-76 stand allowed and that claims 4 and 26-35 would be allowed if rewritten in independent form to include the limitations of the base claims and any intervening claims from which they depend.

Claim 1 stands rejected under 35 U.S.C. § 102(b). Claim 25 stands rejected under 35 U.S.C. § 102(e). Claims 2, 3, 5, and 6 stand rejected under 35 U.S.C. § 103(a). Applicant respectfully traverses the rejections of record.

## II. The 35 U.S.C. § 102 Rejections

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Ibukuro, United States patent number 4,961,057 (hereinafter *Ibukuro*). Claim 25 stands rejected under 35 U.S.C. § 102(e) as being clearly anticipated by Meyer, United States patent number 6,049,251 (hereinafter *Meyer*). To anticipate a claim under 35 U.S.C. § 102, a reference must teach every element of the claim, see M.P.E.P. § 2131.

In responding to the rejection of record as set forth in the Office Action mailed April 24, 2002, Applicant pointed out that independent claim 1 recites "a high frequency response of said amplifier is maintained by selectively varying an adjustable capacitor on said second amplification stage." Applicant asserted that the AGC amplifier of *Ibukuro* does not maintain a high frequency response of the amplifier by varying an adjustable capacitor, but instead utilizes adjustment of the capacitor to adjust the amplifier gain to compensate for a variation in cable loss from a standard loss. In responding to Applicant's previous assertions, the Examiner opines the "*Ibukuro* clearly maintains the frequency response of the amplifier by taking into consideration the cable loss of the amplifier," the final Office Action at page 5. Applicant respectfully asserts that varying the gain of an amplifier based upon the cable loss associated with an input signal does not teach or suggest maintaining the frequency response of the amplifier.

The recited frequency response is with respect to the amplifier of claim 1. The phrase "frequency response" has a clear and accepted meaning in the art that prevents reading of the AGC amplifier of *Ibukuro*, being adjusted for signal loss associated with a transmission cable coupled thereto, to meet the claim. For example, the Larousse Dictionary of Science and Technology defines frequency response as "[f]or constant input power applied to a transducer through a range of discrete frequencies, the envelope of the output powers at each of those frequencies over the given range," *Larousse Dictionary of Science and Technology*, at page 452 (1995), a copy of the relevant page of which is included with this response for the Examiner's convenience. It should be noted that the cable loss is not "of" the amplifier, as asserted by the Examiner, but instead is external to the amplifier disclosed therein. The input power applied to the amplifier of *Ibukuro* varies according to the signal loss associated with the transmission cable. Indeed, *Ibukuro* expressly teaches that "[t]he AGC amplifier

compensates cable loss to restore an amplitude so that a gain thereof is controlled by the peak detector and the DC amplifier to restore a peak of a wave equalized at the equalizer,” column 1, lines 29-32. Accordingly, *Ibukuro* does not fairly teach that the frequency response of the amplifier is maintained, but instead teaches that the gain of the amplifier is adjusted to compensate for variations in the input power applied to the amplifier associated with cable loss. As such, claim 1 and the claims dependent therefrom are asserted to be allowable over the 35 U.S.C. § 102 rejection of record.

Independent claim 25 has been amended by the present Amendment to include the limitations of claim 26. Accordingly, claim 25 now presents claim 26, as originally submitted, in independent form. Claim 27 has been amended to depend from amended claim 25 rather than canceled claim 26. As claim 26 has been indicated by the Examiner to be allowable, it is respectfully asserted that the rejection of record with respect to claim 25, as amended, as well as claims 27-35 dependent therefrom, is moot.

### III. The 35 U.S.C. § 103 Rejections

Claims 2, 3, 5, and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ibukuro*. To establish a *prima facie* case of obviousness, three basic criteria must be met, see M.P.E.P. § 2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Without conceding the remaining criteria, Applicant respectfully asserts that the references lack proper motivation to have led one of ordinary skill in the art to make the necessary modifications.

The prior arguments with respect to the Examiner’s *prima facie* case of obviousness submitted by Applicant in the Response filed July 29, 2002, are believed to still be applicable to the above rejection of record and are, accordingly, incorporated herein. However, for the sake of brevity, those arguments will not be repeated herein. Applicant respectfully requests that the Examiner reconsider Applicant’s previous arguments, with respect to insufficient motivation to combine the references, in combination with the comments set forth below.

In response to Applicant's previous assertions in the Response filed July 29, 2002, that proper motivation to modify the applied reference under 35 U.S.C. § 102 has not been established, the Examiner asserts that one reason is to vary gain. However, the system of *Ibukuro* as taught provides for varying gain, see e.g., column 3, lines 32-35, and Figure 1B. The hypothetical person skilled in the art can summarily be described as one who thinks along lines of conventional wisdom in the art, and as being neither one who undertakes to innovate nor one who has the benefit of hindsight. Applicant does not understand how the Examiner can rely upon varying gain as a reason to modify *Ibukuro* to meet the present claims when *Ibukuro* in its unmodified state already varies gain.

The Examiner further offers that another reason for modification of *Ibukuro* to meet the present claims is to utilize a balanced signal as is conventionally done. Applicant previously asserted that there is nothing in the disclosure of *Ibukuro* to teach or suggest the use of a balanced transistor configuration (all the claim limitations must be taught or suggested by the prior art, M.P.E.P. § 2143.01). However, Applicant's specification does teach differential arrangement as relied upon by the Examiner in opining that it would have been obvious to modify *Ibukuro* to meet the present claims. Applicant therefore concluded that the Examiner must be relying upon hindsight gleaned from Applicant's disclosure in rejecting the claims. In response, the Examiner asserts that Applicant believes that *Ibukuro* must be the only reference that must suggest the combination. As *Ibukuro* is the only reference applied in the Office Action, and the Examiner has failed to properly take official notice (see M.P.E.P. § 2144.03), Applicant's only logical conclusion is that the Examiner has improperly relied upon the disclosure provided by Applicant. However, if the Examiner is relying upon personal knowledge or taking official notice of some fact, the Examiner is hereby requested under Rule 37 C.F.R. § 1.104(d)(2) to provide and make of record an affidavit setting forth his data as specifically as possible for the assertion, or alternatively under M.P.E.P. § 2144.03 the Examiner is hereby requested to cite a reference in support of the assertion. Otherwise the rejection of record should be withdrawn.

With respect to claims 5 and 6, Applicant showed in the Response filed July 27, 2002, that *Ibukuro* teaches away from the recited single chip configuration. The Examiner has not addressed the fact that *Ibukuro* teaches away from the configuration of these claims and, instead, merely restates that integration is a well-known structure to save space, see the final

Office Action at page 4. It is respectfully asserted that a *prima facie* case of obviousness has not been established with respect to claims 5 and 6.

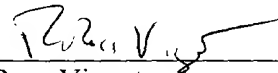
#### IV. Summary

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

Applicant respectfully requests that the Examiner call the below listed attorney if the Examiner believes that a discussion would be helpful in resolving any remaining problems.

Dated: January 3, 2003

Respectfully submitted,

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**Version With Markings to Show Changes Made**

25. (Amended) A method for providing variable gain amplification comprising the steps of:

selecting an operating mode of a plurality of operating modes of an amplifier based at least in part on an input signal characteristic, wherein said selected operating mode of said amplifier maintains a particular Third-Order Intercept Point (IP3); and  
varying a gain of said amplifier based at least in part on said selected operating mode.

Claim 26 has been canceled by this Amendment.

27. (Amended) The method of claim [26] 25, wherein said amplifier comprises a plurality of amplification stages, each of said amplification stages having a variable gain contribution to a total gain of said amplifier, and wherein said varying said gain step comprises the steps of:

selecting a particular amplification stage for manipulation based at least in part on said selected operating mode; and  
varying a gain of said selected amplification stage.

# LAROUSSE

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*General Editor*

Professor Peter M B Walker, CBE, FRSE



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infinite but in practice can be taken as approximately the band occupied by the carrier between its maximum and minimum frequencies plus twice the bandwidth of the modulating signal. Abbrev *FM*.

**frequency-modulation receiver** (*Electronics, Telecomm*) One incorporating a frequency demodulator. See *frequency discriminator*, *Foster-Seeley discriminator*, *ratio detector*.

**frequency monitor** (*ElecEng*) Nationally or internationally operated equipment to ascertain whether or not a transmitter is operating within its assigned channel.

**frequency multiplier** (*Electronics*) Non-linear circuit in which the output circuit is tuned to select a harmonic of the input signal. Transistor or varactor diode circuits may be used.

**frequency of gyration** (*Electronics*) That of electrons about a line indicating direction of magnetic field in ionosphere.

**frequency of infinite attenuation** (*Telecomm*) A frequency at which a filter inserted in a communication channel provides a maximum attenuation theoretically infinite with loss-free inductances and capacitances. Such large attenuation is generally provided by an anti-resonant series arm, or by an acceptance resonant shunt arm.

**frequency of penetration** (*Phys*) The frequency of a wave which just fails to be reflected by ionospheric layer.

**frequency overlap** (*Telecomm*) Common parts of frequency bands used, eg for the regular video signal and the chrominance signal in colour TV.

**frequency pulling** (*Telecomm*) Change in oscillator frequency resulting from variation of load impedance.

**frequency relay** (*ElecEng*) See *relay*.

**frequency response** (*Phys*) For constant input power applied to a transducer through a range of discrete frequencies, the envelope of the output powers at each of those frequencies over the given range. The response may either be measured absolutely in watts against hertz; by implication, eg volts or intensity against frequency; or proportionately, eg decibels below peak output response against frequency. A flat or level response therefore indicates equal response to all frequencies within the stated range, eg for audio equipment an equal response to within, say, 1 dB for the range 20 Hz to 20 kHz.

**frequency selectivity** (*Telecomm*) See *selectivity*.

**frequency-shift keying** (*Telecomm*) In radiotelegraphy, altering the carrier by mark-and-space keying.

**frequency-shift transmission** (*Telecomm*) A form of modulation used in communication systems in which the carrier is caused to shift between two frequencies denoting respectively on and off pulse.

**frequency stabilization** (*Telecomm*) Prevention of changes produced in frequency of oscillation of a self-oscillating circuit by changes in supply voltage, load impedance, valve parameters etc. Achieved by resonating crystals, tuned cavities or transmission lines.

**frequency standard** (*Telecomm*) (1) Reference oscillator of very high frequency stability; may be quartz-crystal controlled, although atomic beam standards provide the ultimate reference. (2) Special transmissions, often with precision time codes added, which can be received worldwide and used as standards.

**frequency swing** (*Telecomm*) Extreme difference between maximum and minimum instantaneous frequencies radiated by a transmitter.

**frequency synthesizer** (*Telecomm*) Source of signals of precisely defined frequency; they may be sine, square or pulse waveform and frequencies may range from zero (dc) to microwave. The output is derived from one or more precision crystal-controlled oscillators, working with multipliers, dividers and mixers.

**frequency table** (*Stats*) A table classifying a set of observations by the number of occurrences of particular values or types.

**frequency tolerance** (*Telecomm*) Extent to which frequency of the carrier of a transmission is permitted to deviate from its allocation.

**frequency transformer** (*ElecEng*) See *frequency changer*.

**frequency translation** (*Telecomm*) Shifting all frequencies in a transmission by the same amount (not through zero).

**frequency tripler** (*Electronics*) See *frequency multiplier*.

**fresco** (*Build*) A method of painting on plastered walls with lime-fast colours while the plaster is still wet.

**fresh-water allowance** (*Ships*) The difference between the freeboard in sea water of 1025 and in fresh water of 1000 oz ft<sup>-3</sup> or g dm<sup>-3</sup>.

**fresh-water sediments** (*Geol*) Sediments which are accumulating or have accumulated in fresh-water, ie river, lake or glaciofluvial environments.

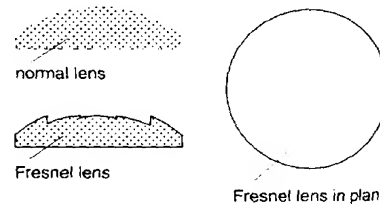
**fresnel** (*Phys*) A unit of optical frequency, equal to 10<sup>12</sup> Hz=1 THz (terahertz).

**Fresnel-Arago laws** (*Phys*) Laws concerning the condition of interference of polarized light. (1) Two rays of light emanating from the same polarized beam, and polarized in the same plane, interfere in the same way as ordinary light. (2) Two rays of light emanating from the same polarized beam and polarized at right angles to each other will interfere only if they are brought into the same plane of polarization. (3) Two rays of light polarized at right angles and emanating from ordinary light will not interfere if brought into the same plane of polarization.

**Fresnel diffraction** (*Phys*) The study of the diffracted field at a distance from an aperture in an absorbing screen, the distance being large compared with the wavelength but not so large that the curvature of the wavefronts can be neglected. See *field*. Cf *Fraunhofer diffraction*.

**Fresnel ellipsoid** (*Phys*) A method of representing the doubly refracting properties of a crystal, used in crystal optics.

**Fresnel lens** (*ImageTech*) A lens having a surface of stepped concentric circles, thinner and flatter than a conventional lens of equivalent focal length; used in viewfinders and as a condenser in studio spot lights.



**Fresnel lens** Annuli in practice have conical surfaces and are closer together.

**Fresnel region** (*Phys*) See *field*.

**Fresnel's biprism** (*Phys*) An isosceles prism having an angle of nearly 180°, used for producing interference fringes from the two refracted images of an illuminated slit.

**Fresnel's mirrors** (*Phys*) Two plane mirrors inclined at an angle of a little less than 180°, used for producing interference fringes from the two reflected images of an illuminated slit.

**Fresnel's reflection formula** (*Phys*) A formula giving the fraction of the intensity of unpolarized incident light reflected at the surface of a transparent medium. The fraction equals

$$\frac{1}{2} \left( \frac{\sin^2(i-r)}{\sin^2(i+r)} + \frac{\tan^2(i-r)}{\tan^2(i+r)} \right)$$

where *i* and *r* are the angles of incidence and refraction respectively.

**Fresnel's rhomb** (*Phys*) A glass rhomb which is used for obtaining circularly polarized light from plane-polarized